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End
wherein the first bonding wire connects the first electrode to the first input terminal by way of the first conductor pattern and the second bonding wire connects the second electrode to the second input terminal by way of the second electrode pattern.

15. (Once Amended) A photosensor-amplifier device as claimed in claim 14, wherein, when the first and second bonding wires are bonded, a first-bonding operation is performed on the first and second chips and a second-bonding operation is performed on the first and second conductor patterns respectively.

A copy of the marked up amended claims is attached to this response showing the changes as set forth in 37 C.F.R. § 1.121.

REMARKS

Claims 1-2, 4-9, and 11-15 are pending in this application. By this Amendment claims 1, 5-9, 11-12, and 14-15 amended. Support for the amendment is found in the specification. No new matter is added.

Applicant gratefully appreciates the courtesies extended by the Examiners to Applicant's representative, Jonathan Kidney, during the Personal Interview conducted on December 19, 2002.

MATTERS OF FORM

The Office Action rejects claim 15 under 35 U.S.C. § 112, second paragraph, asserting indefiniteness. Applicant has amended claim 15 to obviate this rejection

CLAIMS 1, 2, 4 and 9 UNDER 35 U.S.C. § 102(b)

The Office Action rejects claims 1, 2, 4 and 9 under 35 U.S.C. § 102(b) over Sawada et al. (U.S. Patent No. 5,652,425). This rejection is respectfully traversed.

Applicant's independent claim 1 recites a photosensor-amplifier device comprising, a photoelectric conversion element that converts an optical signal into an electric signal, a first electrode connected electrically to the photoelectric conversion element and by which the electric signal is extracted from the photoelectric conversion element. A second electrode formed on the photoelectric conversion element in close proximity to the first electrode in such a way that their electric signal does not pass through the second electrode. Included is an amplifier circuit that has a first input terminal and a second input terminal and that amplifies and then outputs a difference between electric signals fed to the first and second input terminals and a first bonding wire connects the first electrode to the first input terminal, and a second bonding wire having substantially an identical length as the first bonding wire and laid substantially parallel thereto, the second bonding wire connects the second electrode to the second input terminal

Applicant's independent claim 9 recites an infrared communication device incorporating a photosensor-amplifier device, wherein the photosensor-amplifier device comprises, a photoelectric conversion element that converts an optical signal into an electric signal, a first electrode connected electrically to the photoelectric conversion element and by which the electric signal is extracted from the photoelectric conversion element. A second electrode is connected physically to the photoelectric conversion element and formed in close proximity to the first electrode, an amplifier circuit that has a first input terminal and a second input terminal and that amplifies and then outputs a difference between electric signals fed to the first and second input terminals. A first bonding wire connects the first electrode to the first input terminal, and a second

bonding wire having substantially an identical length as the first bonding wire and laid substantially parallel thereto, the second bonding wire connects the second electrode to the second input terminal.

As agreed upon in the Personal Interview, Sawada discloses a photoelectric conversion module with a noise compensation circuit having preamplifiers 4 and 6 connected to a capacitor 5 and a photodiode 1. The preamplifier is connected to lead pins 36-39, which in turn are connected to an external differential amplifier 600, as shown in Fig. 3 of Sawada. See also col. 4, lines 39-44. The noise is amplified by the amplifiers 4 and 6, and is then cancelled by the differential amplifier 600.

As discussed in the Personal Interview, the lead pins 36-39 are not bonding wires. It is well known in the art that bonding wires and lead pins provide different features. Specifically, lead pins are for external connection (plugging in and out via interconnection sockets), while bonding wires are primarily for internal connections (not pluggable).

Moreover, since Sawada's circuit cancels the noise outside the package 10, after noise amplification by the pre-amplifiers 4 and 6., Sawada suffers from increased cross-talk within the package 10. As such, Sawada's "circuit" is not a "photoelectric conversion element", the term "element" being understood in the art as implying an individual entity. Further, Sawada's device requires multiple packages and five (5) lead pins/terminals to accomplish its goals of noise cancellation. In contrast, Applicant's invention provide noise cancellation "inside" the package and reduces the number of terminals, as compared to Sawada.

Therefore, in view of the above, Applicant respectfully submits that Sawada does not disclose or suggest all the claimed features of Applicant's invention.

Claims 2 and 4 depend from claim 1. Thus, for at least the above reasons, Applicant respectfully requests the withdrawal of this rejection.

CLAIM 5 UNDER 35 U.S.C. § 103(a)

The Office Action rejects claim 5 under 35 U.S.C. § 103(a) over Sawada in view of Agarwal (U.S. Patent No. 6,175,438). This rejection is respectfully traversed.

Agarwal discloses an interference-rejecting circuit having detectors 201 and 202, preamps 203 and 204, interference-rejection element 205 (a differential amplifier, corresponding to 305 in Fig. 3), etc. The interference-rejection of Agarwal is based on the principle of differential amplifiers which reject common-mode signals (see col. 3, lines 22-37).

However, at no point does Agarwal disclose or suggest the features discussed above, lacking in Sawada. Therefore, for the same reasons discussed above regarding Sawada, Agarwal does not supply the subject matter lacking in Sawada. Accordingly, Sawada and Agarwal, individually or in combination, do not disclose or suggest all the claimed features of Applicant's invention.

Claim 5 depends from claim 1. Thus, for at least the above reasons, Applicant respectfully requests the withdrawal of this rejection.

CLAIM 6 UNDER 35 U.S.C. § 103(a)

The Office Action rejects claim 6 under 35, U.S.C. § 103(a) over Sawada in view of Liang et al. (U.S. Patent No. 5,781,233). This rejection is respectfully traversed.

Liang is applied by the Office Action for teaching a dummy photodiode formed of a N-P junction material. However, as plainly evident from the disclosure of Liang, there is no discussion or teaching relating to the features discussed above lacking in Sawada. In fact,

Liang is not concerned with noise cancellation in any manner related to the Applicants' invention.

Therefore, Applicant respectfully submits that Liang does not cure the deficiency in Sawada. Accordingly, Sawada and Liang, individually or in combination, do not disclose or suggest all the claimed features of the Applicant's invention.

Claim 6 depends from claim 1. Thus, claim 6 contains patentable subject matter for depending on independent claim 1, as well as for the additional features recited, therein. In view of at least the above reasons, Applicant respectfully requests the withdrawal of this rejection.

CLAIMS 7-8 UNDER 35 U.S.C. § 103(a)

The Office Action rejects claims 7-8 under 35 U.S.C. § 103(a) over Sawada in view of Watanabe (U.S. Patent No. 5,132,532). This rejection is respectfully traversed.

Watanabe simply discloses a photoelectric converter module. Bonding wires 22 are disclosed. The Office Action applies Watanabe for disclosing first and second conductor patterns. However, at no point does Watanabe disclose or suggest the first electrode in such a way that the electric signal does not pass through the second electrode, or a first bonding wire and a second bonding wire, wherein they are substantially parallel and substantially identical in length, as recited in Applicant's independent claim 1.

Therefore, Watanabe does not cure the deficiencies of Sawada, as discussed above. Accordingly, Applicant respectfully submits that Sawada and Watanabe, individually or in combination, do not disclose or suggest all the claimed features of Applicant's invention.

Claims 7 and 8 depend from claim 1. Accordingly, for at least the above reasons, Applicant respectfully requests the withdrawal of this rejection

CLAIM 11 UNDER 35 U.S.C. § 103(a)

The Office Action rejects claim 11 under 35 U.S.C. § 103(a) over Sawada in view of Nishiyama (U.S. Patent No. 5, 610,395). This rejection is respectfully traversed.

Applicant's independent claim 11 recites a photosensor-amplifier device comprising, a first chip having a photoelectric conversion element that converts an optical signal into an electric signal, a first electrode formed on the first chip and connected electrically to the photoelectric conversion element. A second electrode is formed on the first chip so as to be located in close proximity to the first electrode, a second chip having an amplifier circuit for amplifying and outputting a difference between electric signals fed thereto, and a first input terminal formed on the second chip and connected electrically to one input portion of the amplifier circuit. A second input terminal is formed on the second chip so as to be located in close proximity to the first input terminal and connected electrically to another input portion of the amplifier circuit, a first bonding wire connecting the first electrode to the first input terminal, and a second bonding wire having substantially an identical length as the first bonding wire and laid substantially parallel thereto, the second bonding wire connecting the second electrode to the second input terminal. Identical bias voltages are applied to the first and second input terminals, a distance between the first electrode and the first input terminal and a distance between the second electrode and the second input terminal are substantially identical, and a distance between the first and second electrodes and a distance between the first and second input terminals are substantially identical.

Nishiyama discloses a photodetector module with a photodiode directly connected to a parallel plate capacitor. Thus, real estate can be minimized and smaller photodetector modules can be fabricated. See Fig. 1, for example.

However, at no point does Nishiyama disclose or suggest any of the features discussed above, lacking in Sawada. In fact, all of Nishiyama's embodiments (see Figs. 1-2, 7, 11-14, and 16) illustrate, at best, multiple bonding wires randomly connected to several other components. Moreover, Fig. 12's "joints" which are similar in form are so configured to reduce the resistance and the self-inductance. See col. 7, lines 49-53, for example. Thus, Nishiyama does not consider nor contemplate any of the "noise" issues that Applicant's invention addresses.

In view of the above, it is readily apparent that Nishiyama does not supply the subject matter lacking in Sawada. Therefore, Applicant respectfully submits that Sawada and Nishiyama, individually or in combination, do not disclose or suggest all the features of Applicant's claimed invention.

Accordingly, for at least the above reasons, Applicant respectfully requests the withdrawal of this rejection.

CLAIMS 12-13 UNDER 35 U.S.C. § 103(a)

The Office Action rejects claims 12-13 under 35 U.S.C. § 103(a) over Sawada in view of Nishiyama, and further in view of Liang. This rejection is respectfully traversed.

For at least the same reasons already discussed above, Applicant respectfully submits that Nishiyama and Liang, do not supply the subject matter lacking in Sawada. Thus, Sawada, Nishiyama and Liang, individually or in combination, do not disclose or suggest all the features of Applicant's claimed invention.

Claims 12-13 depend from claim 11. Therefore, in view of the above, Applicant respectfully requests the withdrawal of this rejection.

CLAIMS 14-15 UNDER 35 U.S.C. § 103(a)

The Office Action rejects claims 14-15 under 35 U.S.C. § 103(a) over Sawada, Nishiyama, and further in view of Watanabe. This rejection is respectfully traversed.

For the same reasons discussed above, Applicant respectfully submits that Nishiyama and Watanabe do not supply the subject matter lacking in Sawada.

Accordingly, Sawada, Nishiyama and Watanabe, individually or in combination, do not disclose or suggest all the features of Applicant's claimed invention.

Claims 14-15 depend from claim 11. Thus, for at least the above reasons, Applicant respectfully requests the withdrawal of this rejection.

CONCLUSION

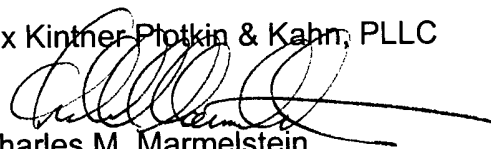
In view of the above remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance of claims is earnestly solicited. Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, Applicant respectfully petitions for an appropriate extension of time. The Commissioner is authorized to charge

payment for any additional fees which may be required with respect to this paper to
Counsel's Deposit Account 01-2300, referring to client-matter number 103213-00020.

Respectfully submitted,

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Enclosures: Marked-Up Copy of Amended Claims

MARKED-UP COPY OF AMENDED CLAIMS

Please amend claims 1, 5-9, 11-12, and 14-15 as follows:

1. (Once Amended) A photosensor-amplifier device comprising:

a photoelectric conversion [circuit] element that converts an optical signal into an electric signal;

a first electrode connected electrically to the photoelectric conversion [circuit] element and by which the electric signal is extracted from the photoelectric conversion [circuit] element;

a second electrode [connected physically to] formed on the photoelectric conversion [circuit] element [and formed] in close proximity to the first electrode in such a way that their electric signal does not pass through the second electrode;

an amplifier circuit that has a first input terminal and a second input terminal and that amplifies and then outputs a difference between electric signals fed to the first and second input terminals;

a first bonding wire that connects the first electrode to the first input terminal; and

a second bonding wire having substantially an identical length as the first bonding wire and laid substantially parallel thereto, the second bonding wire that connects the second electrode to the second input terminal

5. (Once Amended) A photosensor-amplifier device as claimed in claim 1,

wherein the photoelectric conversion [circuit] element includes a photodiode built by joining an N-type semiconductor and a P-type semiconductor together, and

the first electrode is connected electrically to one end of the photodiode[, and

the second electrode is electrically open].

6. (Once Amended) A photosensor-amplifier device as claimed in claim 1, where the photoelectric conversion [circuit] element includes a photodiode comprised of joining an N-type semiconductor and a P-type semiconductor together a diode comprised of joining an N-type semiconductor and a P-type semiconductor together and shield from light;

the first electrode is connected electrically to one end of the photodiode; and

the second electrode is [electrically open] connected to one end of the diode.

7. (Once Amended) A photosensor-amplifier device as claimed in claim 1, further comprising:

a substrate on which a first element formed as the photoelectric conversion [circuit] element and a second element formed as the amplifier circuit are mounted; and

a first conductor pattern and a second conductor pattern formed on the substrate,

wherein the first bonding wire connects the first electrode to the first input terminal by way of the first conductor pattern and the second bonding wire connects the second electrode to the second input terminal by way of the second conductor pattern.

8. (Once Amended) A photosensor-amplifier device as claimed in claim 7,

wherein, when the first and second bonding wires are bonded, a first-bonding operation is performed on the first and second elements and a second-bonding operation is performed on the first and second conductor patterns, respectively.

9. (Once Amended) An infrared communication device incorporating a
photosensor-amplifier device,

wherein the photosensor-amplifier device comprises:

a photoelectric conversion [circuit] element that converts an optical signal into an
electric signal;

a first electrode connected electrically to the photoelectric conversion [circuit]
element and by which the electric signal is extracted from the photoelectric conversion
[circuit] element;

a second electrode connected physically to the photoelectric conversion [circuit]
element and formed in close proximity to the first electrode, an amplifier circuit that has
a first input terminal and a second input terminal and that amplifies and then outputs a
difference between electric signals fed to the first and second input terminals;

a first bonding wire that connects the first electrode to the first input terminal; and

a second bonding wire having substantially an identical length as the first
bonding wire and laid substantially parallel thereto, the second bonding wire that
connects the second electrode to the second input terminal.

11. (Once Amended) A photosensor-amplifier device comprising:

a first chip having a photoelectric conversion [circuit] element that converts an
optical signal into an electric signal;

a first electrode formed on the first chip and connected electrically to the
photoelectric conversion [circuit] element;

a second electrode formed on the first chip so as to be located in close proximity
to the first electrode,

a second chip having an amplifier circuit for amplifying and outputting a difference between electric signals fed thereto;

a first input terminal formed on the second chip and connected electrically to one input portion of the amplifier circuit;

a second input terminal formed on the second chip so as to be located in close proximity to the first input terminal and connected electrically to another input portion of the amplifier circuit;

a first bonding wire connecting the first electrode to the first input terminal;

and

a second bonding wire having substantially an identical length as the first bonding wire and laid substantially parallel thereto, the second bonding wire connecting the second electrode to the second input terminal,

wherein identical bias voltages are applied to the first and second input terminals,

a distance between the first electrode and the first input terminal and a distance between the second electrode and the second input terminal are substantially identical, and a distance between the first and second electrodes and a distance between the first and second input terminals are substantially identical.

12. (Once Amended) A photosensor-amplifier device as claimed in claim 11,

wherein the photoelectric conversion [circuit] element is a photodiode formed, on a semiconductor substrate of one conductivity type, by joining a semiconductor of another conductivity type and coating a top surface with an insulating film;

the first electrode is formed by removing a part of the insulating film so that the first electrode is made contact with the semiconductor of another conductivity type; and

the second electrode is formed on the insulating film and is electrically open.

14. (Once Amended) A photosensor-amplifier device as claimed in claim 11, further comprising:

a substrate, having a first conductor pattern and a second conductor pattern formed thereon, for mounting the first chip and the second chip thereon,

wherein the first bonding wire connects the first electrode to the first input terminal by way of the first conductor pattern and the second bonding wire connects the second electrode to the second input terminal by way of the second electrode pattern.

15. (Once Amended) A photosensor-amplifier device as claimed in claim 14,

wherein, when the first and second bonding wires are bonded, a first-bonding operation is performed on the first and second chips and a second-bonding operation is performed on the first and second [conductivity] conductor patterns respectively.